

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
24 February 2005 (24.02.2005)

PCT

(10) International Publication Number
WO 2005/018038 A2

(51) International Patent Classification⁷: H01M 10/04,
10/40, 10/48, 2/08, 4/02

AMMUNDSEN, Brett (NZ/NZ); 209 Piha Road, Piha,
Auckland (NZ).

(21) International Application Number:
PCT/EP2004/009183

(74) Agents: OSTERTAG, Reinhard et al.; Ostertag & Part-
ner, Eibenweg 10, 70597 Stuttgart (DE).

(22) International Filing Date: 16 August 2004 (16.08.2004)

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/495,324 15 August 2003 (15.08.2003) US

(71) Applicant (for all designated States except US): PACIFIC
LITHIUM NEW ZEALAND LIMITED (NZ/NZ); 2
Mana Place, Manukau City, Auckland (NZ).

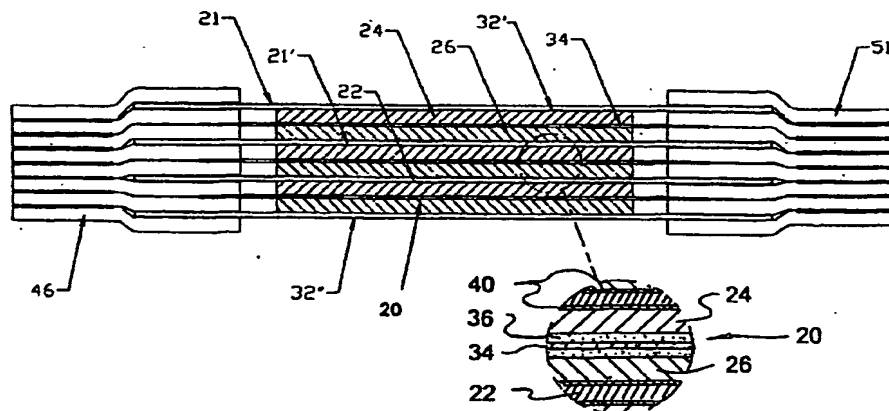
(72) Inventors; and

(75) Inventors/Applicants (for US only): DESILVESTRO,
Hans [CH/NZ]; 16 Del Mar Court, Howick, Auckland
(NZ). VAN VEEN, Casey, Ann [NZ/NZ]; 10 Ashland
Place, Manurewa, Auckland (NZ). JIANG, Nancy, Lan
[NZ/NZ]; 5-134 Onewa Road, Northcote, Auckland (NZ).

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: RECHARGEABLE BIPOLAR HIGH POWER ELECTROCHEMICAL DEVICE WITH REDUCED MONITORING
REQUIREMENT



(57) Abstract: The present invention is drawn to a high power electrochemical energy storage device in a bipolar configuration, comprising at least n stackable cells (20) in bipolar configuration wherein subgroups of m cells are electronically monitored (63). The storage cells (20) have a lithium ion insertion anode (24) and a lithium ion insertion cathode (26), a separator (36), an electrolyte system (36), and a leak-proof seal structure (51). A number of embodiments are disclosed, characterized by a favorable range of m values, in combination with the anode-to-cathode capacity ratio, electrolyte conductivity, and other battery key features, thereby providing a high power device providing long cycle life and excellent power performance over many thousand charge and discharge cycles while minimizing the cost for electronic monitoring. Additionally, the present invention is drawn to a device combining two or more groups of stackable cells in bipolar configuration, either in series or in parallel or any combination thereof, so as to create a high power, high voltage energy storage device.